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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,057	05/26/2006	Sandrine Dulac	007035.00013	1254

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BANNER & WITCOFF, LTD.
TEN SOUTH WACKER DRIVE
SUITE 3000
CHICAGO, IL 60606

EXAMINER	
PATEL, DEVANG R	
ART UNIT	**PAPER NUMBER**
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,057	DULAC ET AL.	
	Examiner	Art Unit	
	DEVANG PATEL	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/15/10 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1, 5, 9-11, 14, 17, 20 and 21** are rejected under 35 U.S.C. 103(a) as being obvious over Childree (US 2002/0041822 A1) in view of Dockus (US 2003/0155409).

   a. **Regarding claim 1**, Childree discloses a process for fluxless brazing of aluminum materials under a controlled atmosphere consisting essentially of nitrogen/argon (¶ 14, 25) at a temperature of between 580°C and 620°C, and rapid cooling (¶ 50-53). The aluminum plate consists essentially of a core aluminum alloy and a single aluminum brazing filler clad onto the core alloy (abstract). Childree teaches that the fluxless brazing process can be carried out on core alloys from the 3XXX, 5XXX or 6XXX series, such as AA-3005 type alloy (¶ 15). The AA 3005 core alloy has composition (% by weight): Si =0.60; Fe =0.7;

Cu 0.3; Mn 1-1.5; Mg 0.2-0.6; Zn=0.25; Ti=0.1; Zr<0.3; Cr<0.3; Ni<2.0; Co<2.0; Bi<0.5; Y<0.5 (i.e. 0), and remainder aluminum (ASM Handbook). Thus, the composition of AA 3005 lies inside or overlaps within the claimed ranges for most of the elements and is very close for the remaining elements. With respect to the brazing filler layer, it includes 4-20 wt% Si and 0.03-0.133 wt% Bi (¶ 16). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. The claim would have been obvious since it has been held that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties (MPEP 2144.05).

b. Childree discloses cladding the single layer on the core plate by well-known processes (such as rolling) in the art (¶ 28), but does not mention coating. However, **Dockus** (also directed to fluxless brazing) discloses applying a cladding layer (just like Childree) on the core alloy using a variety of processes including rolling or spray coating (¶ 96-97; layer 2 in fig. 2). In view of that, it would have been obvious to a person of ordinary skill in the art at the time of the invention to coat the clad layer on the core alloy in the method of Childree since such is an art-recognized alternative of applying a clad layer.

c. As to claim 5, Childree discloses that zinc content of the core alloy is less than 0.2%.

d. As to claim 9, Childree discloses that brazing layer is cladded onto the core alloy by co-rolling (¶ 28).

e. As to claim 10, in accordance with broadest reasonable interpretation, the brazing filler layer of Childree is intrinsically composed of particles.

f. As to claim 11, it is noted that "process used for manufacturing of heat exchangers" recites an intended use and does not further limit the process of making an aluminum alloy plate assembly. Nonetheless, Childree teaches using the process of the brazed assembly in manufacturing heat exchangers (¶ 7, 34) and aging is reasonably expected to occur in hot parts during operation of the exchanger.

g. **Regarding claim 14**, Childree discloses a process for fluxless brazing of aluminum materials under a controlled atmosphere consisting essentially of nitrogen/argon (¶ 14, 25) at a temperature of between 580°C and 620°C, and rapid cooling (¶ 50-53). The aluminum plate consists essentially of a core aluminum alloy and a single aluminum brazing filler clad onto the core alloy (abstract). The cladded brazing filler layer includes 4-20 wt% Si and 0.03-0.133 wt% Bi (¶ 16). The AA 3005 core alloy taught by Childree discloses overlapping weight ranges for Si, Mg, Mn and Cu, and thus renders the claimed ranges obvious for the reasons explained in claim 1 above. Childree discloses cladding the single layer on the core plate by well-known processes (such as rolling) in the art (¶ 28), but does not mention coating. However, **Dockus** discloses applying a cladding layer (just like Childree) on the core alloy using a variety of processes

including rolling or spray coating (¶ 96-97; layer 2 in fig. 2). In view of that, it would have been obvious to a person of ordinary skill in the art at the time of the invention to coat the clad layer on the core alloy in the method of Childree since such is an art-recognized alternative of applying a clad layer.

h. As to claim 17, Childree teaches the core alloy including 0.35 wt% Mg.

i. **Regarding claim 20**, Childree discloses a brazing sheet for fluxless brazing of aluminum materials under a controlled atmosphere consisting essentially of nitrogen/argon at a temperature of between 580°C and 620°C (¶ 25, 50-53). Examiner also points out that "suitable for fluxless brazing…" is an intended use of the brazing sheet and does not further limit the product claim. The brazing sheet of Childree consists essentially of a core aluminum alloy and a single aluminum brazing filler clad onto the core alloy (abstract). The cladded brazing filler layer includes 4-20 wt% Si and 0.03-0.133 wt% Bi (¶ 16) and occupies an entire thickness between the core alloy and respective outer surface of the brazing sheet. The AA 3005 core alloy taught by Childree discloses overlapping weight ranges for claimed elements, and thus renders the claimed ranges obvious for the reasons explained in claim 1 above. Childree discloses cladding the single layer on the core plate by well-known processes (such as rolling) in the art (¶ 28), but does not mention coating. However, **Dockus** discloses applying a cladding layer (just like Childree) on the core alloy using a variety of processes including rolling or spray coating (¶ 96-97; layer 2 in fig. 2). In view of that, it would have been obvious to a person of ordinary skill in the art

at the time of the invention to coat the clad layer on the core alloy in the method of Childree since such is an art-recognized alternative of applying a clad layer.

j. As to claim 21, Childree discloses that one or both faces of the core alloy may have a clad filler layer (¶ 25).

2. **Claims 2-4, 8, 12, 15, 18 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Childree in view of Dockus as applied to claims 1 and 14 above, and further in view of Miller (US 5863669).

k. As to claims 2-4, Childree discloses Cu, Mn, and Mg content which is close enough to the claimed ranges such that one skilled in the art would have expected them to have the same properties. Nonetheless, **Miller** (also directed to Al-alloy brazing) discloses an aluminum core alloy with having a composition (% by weight): Si >0.30; Fe <1.0 ; Cu 0.3-1.0; Mn 0.7-1.5; Mg 0.1-0.6; Ti<0.1; Zr<0.3; Cr<0.3; Ni<2.0; Co<2.0; Bi<0.5; Y<0.5 (i.e. 0), remainder aluminum (col. 3, lines 54-65; col. 4, lines 20-36). The core alloys taught by Childree and Miller are very analogous and more specifically, Miller also teaches that AA 3005 core alloy has been known in the prior art (col. 1, line 21). The claim would have been obvious because the substitution of one known core alloy for another would have yielded predictable results to one of ordinary skill in the art.

l. As to claim 8, Childree as modified by Miller above teaches the claimed composition. The claim would have been obvious to an artisan for the same reasons set forth in claims 2-4 above.

m. As to claims 12 and 15, Childree fails to disclose aging. However, Miller discloses aging at an elevated temperature in the range of 100°C - 250°C after rapid cooling, which results in high post-brazing strength properties (col. 5, lines 26-58). It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate aging steps similar to Miller in the process of Childree in order to obtain high post-brazing strength properties (Miller).

n. As to claim 18, Childree in view of Miller teaches the claimed composition. The claim would have been obvious to an artisan for the same reasons set forth in claim 8 above.

o. As to claim 22, Childree as modified by Dockus discloses coating one face of the core alloy with the brazing alloy but fails to disclose an opposed face coated with an Al-Zn alloy. However, Miller discloses that it is known in prior art to provide Al-Si brazing layer on one side of the core, and a sacrificial anode layer of Al-Zn alloy on the other side for the purpose of reducing corrosion (col. 2, lines 4-7). Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to coat the opposed face of the core alloy with a sacrificial Al-Zn alloy in the process of Childree in order to impart corrosion resistance to the assembly.

3. **Claims 6-7 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Childree in view of Dockus as applied to claims 1 and 14 above, respectively, and further in view of Bye et al. (US 4929511, "Bye", of record).

p. As to claims 6-7 and 16, Childree does not disclose claimed bismuth or yttrium content in the core alloy.. **Bye** is drawn to a method of making aluminum based brazing foils in fluxless brazing processes (col. 2, lines 30-33). Bye discloses that the alloy composition includes 0-0.2 wt% of at least one element selected from the group including bismuth, strontium, lithium, yttrium, calcium, and 0-2 wt% of at least one rare earth metals (col. 2, lines 33-42). Thus, 0.1 wt% of bismuth and 0.1 wt% of yttrium overlaps with claimed ranges. Bye teaches that such alloying elements influence the filler metal flow, refine the microstructure of the brazed joint, thereby improving the mechanical properties of the joint. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate claimed amounts of bismuth and yttrium in the core alloy of Miller because doing so would influence the filler metal flow, refine the microstructure of the brazed joint, thereby improving the mechanical properties of the joint (Bye- col. 2, lines 45-50).

4. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Childree in view of Dockus as applied to claim 10 above, and further in view of Teshima et al. (US 6234377, "Teshima", of record).

q. As to claim 13, Childree or Dockus does not disclose the brazing alloy coating containing a polymer resin. However, **Teshima** (drawn to brazing composition and method of brazing Al material) discloses coating brazing alloy particles by a suitable polymer resin (col. 6, line 65- col.7, line 19). Teshima discloses that the addition of such a resin improves properties such as the

uniformity of the surface and adhesion of the coating. Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the polymer resin of Teshima in brazing alloy coating of Childree and Dockus in order to improve properties such as the uniformity of the coated surface and adhesion of the coating (Teshima- col. 3 line 63-col.4, line 4).

Response to Amendment and Arguments

Applicant's arguments with respect to claims 1-18 and 20-22 have been fully considered but are moot in view of the new ground(s) of rejection set forth above.

Conclusion

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devang Patel/
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793